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L4: Entry 10 of 11

File: USPT

May 20, 1997

DOCUMENT-IDENTIFIER: US 5631124 A

TITLE: Method of producing a photographic polyester laminate support

Brief Summary Text (6):

On the other hand, a polyester support that is formed from polyethyleneterephthalate (hereinafter abbreviated as PET) excels in mechanical strength and is suitable for making a thin support. But it has the drawback that the core set curl cannot be recovered. With regard to a method of removing this drawback from the polyester support, U.S. Pat. No. 4,141,735 describes a method of preventing the core set curl, which method comprises subjecting a polyester-series polymer to heat processing at its glass transition temperature (hereinafter referred to as Tg) or a temperature lower than the Tg (hereinafter referred to as "below Tg annealing," abbreviated as BTA).

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L4: Entry 4 of 11

File: USPT

Sep 28, 2004

DOCUMENT-IDENTIFIER: US 6797458 B2

TITLE: Photographic multi-layer film base comprising 1,4-cyclohexane dimethanol

Brief Summary Text (6):

Another general problem with PET film is its tendency to take up high levels of curl during storage in cartridges at high temperatures and its inability to sufficiently lower this curl during photoprocessing as commonly exhibited by CTA-based photographic films. A solution to the latter problem was proposed in U.S. Pat. No. 5,556,739 to Nakanishi et al, U.S. Pat. No. 5,387,501 to Yajima et al., and U.S. Pat. No. 5,288,601 to Greener et al. in which multilayered supports comprise polyesters modified by sulfonate and other hydrophilic moieties that facilitate, in wet processing, recovery of curl imposed on the film during storage in a cartridge. Another general approach to lowering the tendency of a polyester film base to take up curl (core-set) during storage is through annealing at elevated temperature and/or by raising the glass transition temperature (Tg) of the polyester.

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defects, e.g., core impressions, blocking, etc., which can lower yields and productivity.

US Patent No. 6,558,884 discloses a poly(ethylene terephthalate)-based photographic film base having improved properties with regard to cutting, perforating, and other finishing or photofinishing operations. The film base is made of a poly(ethylene terephthalate)-based material comprising a specified amount of monomeric units derived from 1,4-cyclohexanedimethanol, such that the film base has a specified cutting-related property.

SUMMARY OF THE INVENTION

It has been found that the use of a high-CHDM PET-based support for an imaging element allows the support material to be annealed very rapidly (less than 6 min) to achieve acceptable core-set and post-process curl properties. With this fast annealing process, it is possible to have an effective in-line annealing step to yield a more efficient process with less annealing-induced defects.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to a process of annealing a film base or a film support comprising a film base, which film base or support is used in a silver-halide photographic film comprising at least one emulsion layer coated on the support, with the emulsion layer comprising gelatin as a major component. The method of manufacture of such a film is well known in the art.

In accordance with the process of the invention, the film support is annealed at temperatures between 60°C and $T_g + 15^\circ\text{C}$, preferably 60°C and $T_g + 10^\circ\text{C}$ for a time preferably less than 6 minutes, wherein T_g is the glass transition temperature of the unprocessed amorphous polyester material used in the film base of the support. In a preferred embodiment, the post-process curl is less than 60 m^{-1} after annealing and wherein the post-process curl is greater than 70 m^{-1} without annealing. In a preferred embodiment, the support is annealed at a temperature between 80 and 105°C, preferably 85 to 100°C, for less than 6 minutes, preferably less than 4 minutes, more preferably about 3 minutes.

WEST Search History

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END OF SEARCH HISTORY

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DATE: Thursday, April 07, 2005

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END OF SEARCH HISTORY

Day : Thursday

Date: 4/7/2005
Time: 16:43:21**PALM INTRANET****Inventor Name Search Result**

Your Search was:

Last Name = GREENER

First Name = JEHUDA

Application#	Patent#	Status	Date Filed	Title	Inventor Name
<u>06554864</u>	4582655	150	11/25/1983	PRODUCTION OF OPTICAL ELEMENT WITH A VARYING REFRACTIVE INDEX	GREENER, JEHUDA
<u>07299209</u>	Not Issued	161	01/23/1989	PROCESS FOR THE PRODUCTION OF LOW BIREFRINGENT POLYMER FILMS	GREENER, JEHUDA
<u>08095137</u>	5288601	150	07/21/1993	LIGHT SENSITIVE SILVER HALIDE ELEMENT HAVING PHOTOGRAPHIC FILM BASE WITH IMPROVED CURL	GREENER, JEHUDA
<u>08098488</u>	5385704	150	07/27/1993	PROCESS OF MAKING POLYETHYLENE TEREPHTHALATE PHOTOGRAPHIC FILM BASE	GREENER, JEHUDA
<u>08305007</u>	5607826	250	09/13/1994	POLYETHYLENE TEREPHTHALATE PHOTOGRAPHIC FILM BASE	GREENER, JEHUDA
<u>08433305</u>	5508135	150	05/03/1995	IMAGING ELEMENT COMPRISING AN ELECTRICALLY-CONDUCTIVE LAYER EXHIBITING IMPROVED ADHESIVE CHARACTERISTICS	GREENER, JEHUDA
<u>08574471</u>	5599658	150	12/19/1995	PHOTOGRAPHIC FILM BASE AND PHOTOGRAPHIC ELEMENTS	GREENER, JEHUDA
<u>08697746</u>	5795512	150	08/29/1996	METHOD AND APPARATUS FOR REDUCING CURL IN WOUND ROLLS OF PHOTOGRAPHIC FILM	GREENER, JEHUDA
<u>08752369</u>	5759756	150	11/19/1996	CO-EXTRUDED FILM WITH NON-CRYSTALLINE CORE	GREENER, JEHUDA

<u>08948219</u>	<u>6071682</u>	150	10/09/1997	CONTROL OF CORE-SET CURL OF PHOTOGRAPHIC FILM SUPPORTS BY COATED LAYERS	GREENER, JEHUDA
<u>09223876</u>	Not Issued	161	12/31/1998	PROCESS OF MAKING POLYETHYLENE TEREPHTHALATE PHOTOGRAPHIC FILM BASE	GREENER, JEHUDA
<u>09472485</u>	<u>6197486</u>	150	12/27/1999	REFLECTIVE PRINT MATERIAL WITH EXTRUDED ANTISTATIC LAYER	GREENER, JEHUDA
<u>09472486</u>	<u>6207361</u>	150	12/27/1999	PHOTOGRAPHIC FILM WITH BASE CONTAINING POLYMERIC ANTISTATIC MATERIAL	GREENER, JEHUDA
<u>09472487</u>	<u>6379780</u>	150	12/27/1999	PERMEABLE SURFACE IMAGINGSUPPORT	GREENER, JEHUDA
<u>09475843</u>	<u>6599991</u>	150	12/30/1999	IN-SITU BLENDING OF POLYESTERS WITH POLY (ETHER IMIDE)	GREENER, JEHUDA
<u>09731271</u>	<u>6485896</u>	150	12/06/2000	EMULSION COMPOSITION TO CONTROL FILM CORE-SET	GREENER, JEHUDA
<u>09731382</u>	Not Issued	161	12/06/2000	SUBLIMATE ELIMINATION IN DYED POLYESTER FILMS BY USE OF BARRIER LAYERS	GREENER, JEHUDA
<u>09853515</u>	<u>6465140</u>	150	05/11/2001	METHOD OF ADJUSTING CONDUCTIVITY AFTER PROCESSING OF PHOTOGRAPHS	GREENER, JEHUDA
<u>09853846</u>	<u>6436619</u>	150	05/11/2001	CONDUCTIVE AND ROUGHENING LAYER	GREENER, JEHUDA
<u>09853905</u>	Not Issued	161	05/11/2001	ANTISTAT OF ONIUM SALT AND POLYETHER POLYMER	GREENER, JEHUDA
<u>10027023</u>	<u>6555303</u>	150	12/21/2001	PHOTOGRAPHIC FILM BASE COMPRISING A POLY (ETHYLENE TEREPHTHALATE)-BASED MATERIAL	GREENER, JEHUDA
<u>10028865</u>	<u>6514646</u>	150	12/21/2001	BALANCED ARCHITECTURE FOR ADHESIVE IMAGE MEDIA	GREENER, JEHUDA
<u>10036668</u>	<u>6558884</u>	150	12/21/2001	PHOTOGRAPHIC FILM BASE COMPRISING A POLY (ETHYLENE TEREPHTHALATE)-BASED MATERIAL	GREENER, JEHUDA

<u>10037050</u>	6645690	150	12/21/2001	PHOTOGRAPHIC MEMBER WITH FLEXIBILIZER MATERIAL	GREENER, JEHUDA
<u>10094289</u>	Not Issued	168	03/08/2002	PHOTOGRAPHIC ELEMENT WITH POLYESTERS BLENDED WITH POLY (ETHER IMIDE)	GREENER, JEHUDA
<u>10094977</u>	6867927	150	03/11/2002	TRANSPARENT SURFACE FORMED COMPLEX POLYMER LENSES	GREENER, JEHUDA
<u>10133836</u>	6872501	150	04/26/2002	ANTISTAT OF ONIUM SALT AND POLYETHER POLYMER	GREENER, JEHUDA
<u>10170117</u>	6838165	150	06/12/2002	CONDUCTIVE AND ROUGHENING LAYER	GREENER, JEHUDA
<u>10279891</u>	6737226	150	10/24/2002	PROCESS FOR MAKING POLYESTER PHOTOGRAPHIC FILM BASE AND PHOTOGRAPHIC ELEMENT COMPRISING SAID BASE	GREENER, JEHUDA
<u>10320330</u>	Not Issued	041	12/16/2002	SUBLIMATE ELIMINATION IN DYED POLYESTER FILMS BY USE OF BARRIER LAYERS	GREENER, JEHUDA
<u>10325386</u>	6797458	150	12/20/2002	A PHOTOGRAPHIC MULTI-LAYER FILM BASE COMPRISING 1,4-CYCLOHEXANE DIMETHANOL	GREENER, JEHUDA
<u>10327365</u>	6727052	150	12/20/2002	MULTILAYER PHOTOGRAPHIC FILM AND AN IMAGING ELEMENT MADE OF SAID BASE	GREENER, JEHUDA
<u>10427399</u>	Not Issued	041	05/01/2003	SUBLIMATE ELIMINATION IN DYED POLYESTER FILMS BY USE OF BARRIER LAYERS	GREENER, JEHUDA
<u>10436654</u>	Not Issued	030	05/13/2003	MANUFACTURING PROCESS AND USE FOR OPEN CELLED MICROCELLULAR FOAM	GREENER, JEHUDA
<u>10436740</u>	Not Issued	094	05/13/2003	MANUFACTURING PROCESS FOR OPEN CELLED MICROCELLULAR FOAM	GREENER, JEHUDA
<u>10443188</u>	6703184	150	05/22/2003	LOW MOISTURE DONOR SUBSTRATE COATABLE WITH ORGANIC LAYERS TRANSFERRABLE IN RESPONSE TO INCIDENT RADIATION	GREENER, JEHUDA
<u>10633183</u>	Not	030	08/01/2003	PROCESS FOR RAPID	GREENER,

	Issued			ANNEALING OF A POLYESTER FILM BASE TO CONTROL FILM CURL	JEHUDA
<u>10667982</u>	Not Issued	071	09/22/2003	ONE-TIME-USE CAMERA CONTAINING IMPROVED FILM ELEMENT	GREENER, JEHUDA
<u>10797982</u>	Not Issued	071	03/11/2004	CONDUCTIVE AND ROUGHENING LAYER	GREENER, JEHUDA
<u>10954330</u>	Not Issued	020	09/30/2004	OPTICAL FILMS AND PROCESS FOR MAKING THEM	GREENER, JEHUDA

Inventor Search Completed: No Records to Display.

Search Another: Inventor

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Day : Thursday

Date: 4/7/2005
Time: 16:43:59 **PALM INTRANET****Inventor Name Search Result**

Your Search was:

Last Name = CONTESTABLE

First Name = BEVERLY

Application#	Patent#	Status	Date Filed	Title	Inventor Name
<u>10633183</u>	Not Issued	030	08/01/2003	PROCESS FOR RAPID ANNEALING OF A POLYESTER FILM BASE TO CONTROL FILM CURL	CONTESTABLE, BEVERLY A.
<u>08948219</u>	<u>6071682</u>	150	10/09/1997	CONTROL OF CORE-SET CURL OF PHOTOGRAPHIC FILM SUPPORTS BY COATED LAYERS	CONTESTABLE, BEVERLY A.

Inventor Search Completed: No Records to Display.

Search Another: Inventor

Last Name	First Name	Search
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Day : Thursday

Date: 4/7/2005
Time: 16:44:32 **PALM INTRANET****Inventor Name Search Result**

Your Search was:

Last Name = GILLMOR

First Name = JEFFREY

Application#	Patent#	Status	Date Filed	Title	Inventor Name
<u>10006545</u>	6767951	150	11/13/2001	POLYESTER NANOCOMPOSITES	GILLMOR, JEFFREY R.
<u>10633183</u>	Not Issued	030	08/01/2003	PROCESS FOR RAPID ANNEALING OF A POLYESTER FILM BASE TO CONTROL FILM CURL	GILLMOR, JEFFREY R.
<u>11000124</u>	Not Issued	020	11/30/2004	COEXTRUDED TONER RECEIVER LAYER FOR ELECTROPHOTOGRAPHY	GILLMOR, JEFFREY R.

Inventor Search Completed: No Records to Display.

Search Another: Inventor

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Search Results - Record(s) 1 through 2 of 2 returned.

☐ 1. Document ID: US 20050026088 A1

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L23: Entry 1 of 2

File: PGPB

Feb 3, 2005

PGPUB-DOCUMENT-NUMBER: 20050026088

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050026088 A1

TITLE: Process for rapid annealing of a polyester film base to control film curl

PUBLICATION-DATE: February 3, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
<u>Greener</u> , Jehuda	Rochester	NY	US	
Contestable, Beverly A.	Hilton	NY	US	
Gillmor, Jeffrey R.	Brockport	NY	US	
Rao, YuanQiao	Pittsford	NY	US	

US-CL-CURRENT: 430/401

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Drawings
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☐ 2. Document ID: US 6727052 B1

L23: Entry 2 of 2

File: USPT

Apr 27, 2004

US-PAT-NO: 6727052

DOCUMENT-IDENTIFIER: US 6727052 B1

TITLE: Multilayer photographic film and an imaging element made of said base

DATE-ISSUED: April 27, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Rao; YuanQiao	Rochester	NY		
<u>Greener</u> ; Jehuda	Rochester	NY		
Fehnel; Robert H.	Rochester	NY		
Brickey; Michael R.	Webster	NY		

US-CL-CURRENT: 430/496; 264/173.15, 264/173.16, 264/210.7, 428/480, 430/494,
430/533

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KUMC	Draw D
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Term	Documents
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